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THE PICATINNY VOICE



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Brainstorming, refining ideas set stage for future technology

Picatinny engineers develop concepts for military helicopters

BY ED LOPEZ

Editor

Engineer Adam Jacob entered the room where the meeting had already begun, and before he had even finished taking off his jacket the meeting facilitator pointed to Jacob and said, "You're up."

The meeting was designed to be fast paced. The goal was to hear 27 presentations, each lasting about three minutes. Since Jacob was scheduled to attend class that day, meeting facilitator Ernie Garcia saw the opportunity to give Jacob an opening to present his ideas then be on his way.

"Who needs to get out of here?" Garcia later asked the assembled group, seeking to adhere to the tight schedule while acknowledging that some presenters couldn't stay for the entire meeting.

The gathering of engineers at the Armament Research, Development and Engineering Center (ARDEC) at Picatinny Arsenal was held to present ideas and concepts for the Future Vertical Lift, or FVL, an initiative created by the Secretary of Defense to focus on enhancing vertical life capabilities and technology development. (Vertical lift is a term largely associated with helicopters.)

The U.S. vertical lift fleet is aging. Typically, platforms remain in service for 40 to 60 years. FVL is intended to provide the foundation to replace the fleet over

The brisk meeting to brainstorm and parse ideas resembled a cross between "technology speed dating" and the television show "Shark Tank," in which entrepreneurs "pitch" ideas that are then subjected to scrutiny.

the next 25 to 40 years.

Platforms for the FVL are expected to provide greater capability to overcome complex terrain, higher altitudes, extreme temperatures and extended distances.

PICATINNY FOCUS IS ON ARMAMENTS AND WEAPONS SYSTEMS

Among the various military services, the Army has been designated as the lead service for the Joint FVL effort.

At Picatinny Arsenal, the focus of the research and engineering center is on armaments and weapons systems, as well as aircraft survivability equipment, that can be used on future aviation systems.

The ARDEC is part of a joint integrated products team, and is working



Sikorsky and Boeing have worked together on their offering for the U.S. Army's joint multi-role technology demonstrator called the SB-1 Defiant. The U.S. Army has been designated as the lead service for the Joint Future Vertical Lift program. (Artist rendering courtesy Sikorsky-Boeing)

closely with U. S. Army Aviation and Missile Research Development and Engineering Center, or AMRDEC, other research and engineering centers, laboratories and other branches of the military.

The compressed meeting to brainstorm and parse ideas resembled a cross between "technology speed dating" and the television show "Shark Tank," in which entrepreneurs "pitch" ideas that are then subjected to scrutiny.

The meeting was held in preparation for an upcoming presentation to the Army aviation community by ARDEC

Technology Director Joseph Pelino, who would periodically drill down for more details as the parade of ideas unfolded.

What is the weight of the proposed product? What is the size? Are there recoil issues? Can it be patented? Can it be developed with an airdrop shape?

At times, Pelino would ask for more information, or suggest that collaboration begin with outside organizations.

"They don't like things hanging off the aircraft because of drag," Pelino would periodically remind the attendees, urging further work on how to minimize drag

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Sgt. Saul Barr (right) and Sgt. 1st Class Robert Nutter (front left) read maintenance procedures for the Common Remotely Operated Weapon Station to Spc. Daniel Patrick using the Interactive Electronic Technical Manual with embedded 3-D technologies. The station allows Soldiers to remotely aim and fire a suite of crew-served weapons. Photo by Cassandra Mainiero.

Advanced, interactive 3-D manual aids CROWS upkeep

BY CASSANDRA MAINIERO

Picatinny Arsenal Public Affairs

In 2011, Picatinny Arsenal made a leap from traditional, black and white manuals when it introduced an interactive manual called the Interactive Electronic Technical Manual (IETM) for the Spider XM7 Network Munition Dispensing Set.

Now, the manual has returned for another system: the XM153 Common Remotely Operated Weapon Station, or CROWS.

The interactive manual is an in-house project from the Logistics Research and Engineering Directorate of the Armament Research, Development and Engineering Center.

"The CROWS IETM is the most

advanced technical manual ARDEC has ever developed. It has proven to increase access to critical repair information, which will certainly maximize the operational availability of the end item in the field," said Nikolaos Mavrakis, Chief of the Systems Support Engineering Branch at the directorate.

"A talented group of technical writers, maintenance engineers, provisioners, and illustrators contributed to the development of this IETM."

The CROWS is a remotely operated system that provides the capability to remotely aim and fire a suite of crew-served weapons. It is compatible with weapons, such as the M2, Mk19, M240

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BRAINSTORMING THE FUTURE

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or address other potential concerns from the aviation community.

Although the presentation of ideas took about 90 minutes, considerable time and effort went into getting to the point where the “pitch” presentations could be held.

“It took about a year of work and three workshops,” said Garcia, Program Manager for Innovation at the Business Interface Office.

During the past year, ARDEC employees participated in a series of meetings and collaboration calls with the FVL team and the U.S. Army Research, Development and Engineering Command community to more fully understand FVL operations and requirements.

Another goal was to identify ARDEC technologies applicable to aviation armaments. Picatinny Arsenal is the Department of Defense’s Joint Center of Excellence for Armaments and Munitions.

WORKSHOPS TO REFINE SOLUTIONS

Pelino had tasked Greg Phillips and Andrei Cernasov to explore concepts for new technology that could address the needs of the Future Vertical Lift. Phillips is the chief of the customer account and relationship management office, which is part of the Business Interface Office. Cernasov is head of the Office for Innovation at ARDEC.

“We were tasked in December to develop a ‘stretch vision’ for aviation lethality and that’s where the recent innovation workshops kicked in, although throughout the past year there were other innovation meetings looking at ideas for aviation weapon systems,” Phillips said.

“This series of recent workshops were more intensive and resulted in more ideas,” Phillips added.

The innovation process involves four workshops. Anyone with an interest in the topic can attend.

The first workshop explains the problems and history, and elicits questions to help address problems. Participants are asked to carefully consider the problem over the next week

During the second workshop, the team discusses potential solutions to problems. Participants are asked to place ideas that will solve the problem into quad charts, then into an idea database.

The team discusses each idea to be placed in the database for validity or clarification, thus ensuring consensus



An artist’s conception of future Army rotorcraft. U.S. Army graphic by AMRDEC VizLab

AT A GLANCE
Future Vertical Lift (FVL)

- Includes multiple sizes/classes of vehicles
- Considers the vertical lift needs across the Department of Defense
- Achieves significant commonality between various platforms
- Addresses capability gaps

that the idea has a potential application to the problem.

During the third workshop, each subject matter expert or SME presents the idea in a quad chart to the team and to senior SMEs for fine-tuning and challenges.

The last workshop is where teams present the ideas to the director of technology. Team members have three to five minutes to present their ideas.

Typically, the director of technology challenges each idea to assure that it has potential application, and selects some of the concepts for further development and refinement.

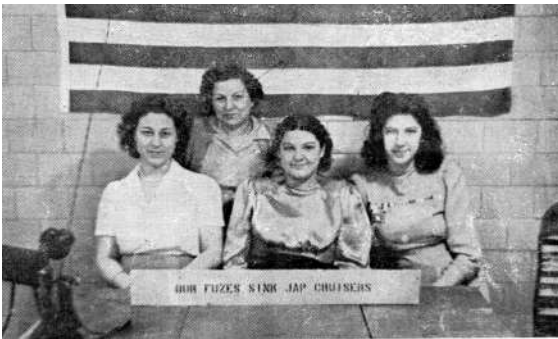
In the case of the future vertical lift, these ideas were then presented to the other organizations on the FVL team as well as to the user community, where they will undergo additional scrutiny for feasibility.

Over time, additional workshops for further refinement are conducted before any ideas are selected for formal proposal development.

Collaboration participants include end-users, such as Soldiers and pilots, along with other laboratories, research and engineering organizations.

Editor’s note: Turn to page 7 for an article from Army Technology magazine that focuses on aviation research.

Looking Back ... At Picatinny



BY PATRICK J. OWENS, ARDEC Historian

The accompanying photo appeared in The Picatinny Barrage, a magazine for arsenal employees, of February 1942, less than three months after the Pearl Harbor bombing.

The four ladies were working 10-hour days handling personnel and production reports in the Office of the Bomb Fuze Area and still found time to make a morale banner.

The magazine did not give their last names, but first names, from left to right, were Katherine, Fannie, Dorothy, and Betty.

The slogan on their banner, “OUR FUZES SINK JAP CRUISERS” was premature. United States Army Air Force planes would not destroy a Japanese cruiser until they bombed the light cruiser Yura on October 25, 1942, and forced its scuttling off Savo Island in the Solomons.

Relate your Vietnam War experiences

This year marks the 50th anniversary since the U.S. entered the Vietnam War.

The Picatinny Arsenal Public Affairs Office is seeking your input. We would like to interview employees who may have served in the military during the Vietnam War, or worked here during that time frame, or were part of a project or development that came out of the Arsenal.

The program also pays tribute to the contributions made on the homefront by the people of the United States.

If you would like to tell your story, please contact Eric Kowal in the Public Affairs Office at 973-724-4901 or eric.w.kowal.civ@mail.mil.

THE PICATINNY VOICE



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Editor’s Note

We want your story ideas. To reach us, please contact the editor at the Picatinny Public Affairs Office.

All manuscripts, photos or artwork may not be returned without prior coordination. Digital images should be submitted at a resolution of at least 200 pixels per inch.

Due to space limitations, the editor reserves the right to edit submitted articles. Contributions can be sent by e-mail to picavoice@conus.army.mil.

The editorial policy of The Picatinny Voice is to accept letters to the editor and commentaries.

Submissions must be signed or received via e-mail through your own account to be considered for publication, but writer’s names may be withheld upon request. Opinions expressed are those of each author and not an official expression of the Department of the Army or the Command.

The PicatinnyVoice reserves the right to select, reject or edit letters and articles to meet space constraints, achieve clarity or for suitability considerations.

<https://www.pica.army.mil/eVoice>



Wearing a Picatinny Arsenal cap provided by Civilians Down Range. Courtesy photos

Auditing service contracts in Afghanistan

Editor's Note: "Civilians Down Range" is a new group at Picatinny Arsenal to support civilians who deploy to support Soldiers.

BY ROSE MICHAELS

I am a former Army civilian employee of the Armament Research, Development and Engineering Center, where I worked as a Product Quality Manager (PQM) for the Quality Engineering and System Assurance Directorate.

During my time at Picatinny, there was no opportunity for me as a PQM to deploy, so I accepted a job with Defense Contract Management Agency (DCMA), which had a deployment mission.

DCMA audits defense contractors to make sure they meet the requirements of DOD contracts.

In the U.S., DCMA provides oversight of commodity contracts. In Afghanistan, DCMA provides oversight of service contracts.

On Nov. 7, 2014, I reported to the CONUS Replacement Center at Fort Bliss, Texas, for one week of training, which included several deployment briefings, a first-aid class, a medical and dental exam.

The most challenging and unique experience was the vehicle rollover training.

A special HUMVEE and Mine Resistant Ambush Protected (MRAP) vehicle were used for rollover training. Wearing my body armor and helmet, I did my rollover training in the HUMVEE with three Army Soldiers.

The week in Texas came to an end, and 35 hours of flight time later, I landed in Kuwait. After a two-hour bus ride, I arrived at Ali Al Salem (the Rock) to wait for a flight to Afghanistan. I flew out two days later to Afghanistan.

I am currently deployed to Bagram Air Field as the QAR for LOGCAP (basic life support) service contracts. DCMA in Afghanistan conducts audits of the contractors that provide basic life support services.

My primary responsibility is to train and manage

my Contractor Officer Representatives, who perform audits on an estimated two-thirds of my LOGCAP audit workload. I also do investigative audits and work on inventory audits.

Several individuals in our DCMA office started "Operation Win Hearts and Minds," where we distributed donated clothing and toys to the children of the village outside of the T-walls of Bagram Air Field.

Over the holidays, I received two "care packages" from Civilians Down Range, which my civilian and military coworkers truly appreciated.



A row of Containerized Housing Units. CHUs are aluminum boxes measuring 22 x 8 feet, a little bigger than a commercial shipping container.

ST. MARY'S PREP STUDENTS GET INTRODUCTION TO STEM



Personnel from Picatinny Arsenal visited St. Mary's Prep school in Denville, New Jersey, on Feb. 24 as part of ongoing outreach efforts to encourage students to consider studies in science, technology, engineering and mathematics, commonly known as STEM. LEFT, two students looking through a various screen sizes inside a brass

cylinder are starting to see the wave nature of light as the mesh size approaches the wavelength of light. RIGHT, George L. Fischer and Shahram Dabiri demonstrate a visual representation of a standing wave function. Fischer is a laser physicist at Picatinny while Dabiri is the technology manager with the STEM outreach program.

New process to save Army money, yield cheaper rounds

Army News Service

McALESTER, Okla. -- A new process at McAlester Army Ammunition Plant, or MCAAP, will make more recovered projectile bodies viable for reuse in the production of field artillery training rounds and provide the military with a cheaper and safer munition, Army officials said.

An estimated 95 percent of obsolete and unserviceable D563 projectile bodies recovered from the "soft touch" demilitarization process can feasibly be reused in the 155 mm M1122 high explosive, or HE, munition being manufactured at the plant.

The new process changes how the base plate is removed from the projectile so the threads remain intact.

"The new 'soft touch' of the manual download line will allow us to use almost all of the downloaded projectiles for M1122 and other programs that reuse those bodies," said Scott Sullivan, M1122 project manager at MCAAP.

"The value is that units get



Joseph Ward injects asphalt into the projectile to cover the surface of the inert cement fill before loading the IMX-101 explosive. Photos by Kevin Jackson, AMC

more training for their training dollars," he said. "It's basically half the price. It's also environmentally-friendly and it's an insensitive munition, which means it's safer to store, transport and handle. It could also be used by other military services."

The new round is manufactured with Insensitive Munition Explosive-101, or IMX-101, which replaces TNT and Composition B. IMX-101 provides a more stable fill because it's less likely to explode if it's in a fire, hit by another munition or

mishandled during transport.

The work is being funded by Project Manager for Combat Ammunition Systems in coordination with Product Manager for Demilitarization, both at Picatinny Arsenal, New Jersey, and is estimated to save the Army \$79 million through fiscal year 2020, according to the M1122 Project Office at Picatinny Arsenal.

The new "soft touch" download process is expected to begin in March.

RIGHT PRODUCT, RIGHT TIME

Projectile bodies recovered at MCAAP are also shipped to Pine Bluff Arsenal, Arkansas, where they are used to manufacture M1123 infrared and M1124 visible light illuminating artillery rounds.

Manufacturing the M1122 entails salvaging the old projectile body and base, removing and demilitarizing the submunitions inside the old Dual-Purpose Improved Conventional Munition, or DPICM, round, and loading, assembling and packing the new round.

"This is a new program that is really the right product at the right time," Sullivan said.

While MCAAP has manufactured projectiles for the Air Force and Navy for many years, Sullivan said there are differences between them and the M1122 artillery round being produced for the Army.

"There are more critical quality characteristics on a single

155 projectile than there are on a bomb and every one of these must pass X-ray inspection," he said.

The new workload is welcome news for the MCAAP workforce.

"Between the download of the DPICM rounds, the cleaning and inspection of the bodies we will reuse, and the load, assembly and pack of the 1122, it represents jobs for 40 to 50 people," Sullivan said.

STABLE REVENUE

MCAAP completed first article acceptance testing of the M1122 and began full-rate production in June 2014. Sullivan said the current projection has the plant work-loaded through 2019.

"We see this as a good stable source of revenue for years to come," he said.

McAlester Army Ammuni-



Julie Breeden applies sealant to the base of the projectile body for the base plate to be permanently attached.

tion Plant is the Department of Defense's premier bomb- and warhead-loading facility.

It is one of 14 installations of the Joint Munitions Command and one of 23 organic industrial bases under the U.S. Army Materiel Command, which include arsenals, depots, activities and ammunition plants.

MCAAP performs ammunition stock-pile management and delivery to the Joint Warfighter for training and combat operations.



Picatinny's 2015 Army Emergency Relief (AER) campaign kicked off March 2, with a cake cutting ceremony at Choices Cafeteria. Marci Keck, AER Officer (red sleeves) and Capt. Justin Metz (far right), the 2015 AER chairperson, were joined by Brig. Gen. and Mrs. Patrick Burden, Col. and Mrs. Scott Turner, Lt. Col. Ingrid Parker and Command Sgt. Maj. Hudene Wright as well as other garrison employees to cut the celebratory cakes. U.S. Army photo by Todd Mozes.

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CORRECTION

In the February 20 issue of The Picatinny Voice, a photo caption misidentified the medal presented to Lt. Col. Joseph Fagan at his retirement ceremony. It was actually the Meritorious Service Medal.

Soldiers learn tricks of improvised explosive device trade

Army News Service

FORT CARSON, Colo. -- Staff Sgt. John Velasquez carefully approached a mock rocket launcher on Range 121A.

Velasquez did so with a metal detector in hand, knowing that mock improvised explosive devices, also known as IEDs, were likely hidden near the visible weapon and thus posed the most immediate danger to himself and his two team members.

Within a few feet of the grenade, his detector confirmed his suspicions.

A small group of Kazakhstan military members looked on intently and watched as Velasquez knelt, then poked through dormant prairie grass and loose sediment.

As Velasquez began rendering the IED as safe, he explained each step in detail.

This scenario was part of a week-long training and information exchange on the week of Feb. 19.

It was hosted by the 663rd Explosive Ordnance Company, 242nd Explosive Ordnance Disposal Battalion, 71st Ordnance Group (Explosive Ordnance Disposal), for Kazakhstan military members.

VALUABLE EDUCATION

Highlighting different scenarios each day, the men and women of the 663rd Ordnance covered tactics and procedures, basic IED construction principles and EOD team tools and equipment.

"This has been a very educational experience for us," said Kazakhstan army Col.



Spc. Jeffrey Kohler, 663rd Ordnance Company, demonstrates employment of the PerCUSSION Actuated Neutralizer, or PAN. The PAN is a versatile tool that can effectively disrupt various types of improvised explosive devices. It is able to fire 12 types of rounds to penetrate varying types of containers.

Kanat Makmetov through an interpreter.

"We develop new training programs for our Soldiers, and it's important for us to develop new methods and gain the best experience from different countries so we can implement them into our system."

Team members introduced tactics and procedures for everything from employing robots to reconnaissance and neutralizing suspected IEDs.

"This exchange may be as important for our company as it is for our guests," said Capt. Jacob Walsh, commander for

the 663rd Ordnance.

"We typically deploy as a unit, but we've also been sending smaller teams on missions to different countries in an effort to train their EODs and engineers. So, bringing the Kazakhstan military members here gives us an opportunity to train for those missions."

After a safety briefing Feb. 19, 663rd Ordnance teams started by demonstrating the dismounted field operation. Next, 663rd teams showed their Kazakhstan counterparts how to use a kinetic

percussion-activated neutralizer, or PAN.

"The PAN is basically a remotely fired 12-gauge shotgun," said Sgt. 1st Class Andrew Olson, 663rd Ordnance. "We can load the shotgun with different cartridges such as water, steel and aluminum depending on the type of IED we're attempting to render as safe."

In the third stage of the day, team members used plastic-explosive shaped charges to cut a variety of materials.

"This training operation isn't just about demonstrating our knowledge and tactics," Walsh said.

"It also gives us an opportunity to interact with interpreters and communicate with the (non-English) speakers we will train in the future. Our team members must know all of the details in order to teach them."

"By talking to people who have multiple questions it forces us to consider aspects we may not have thought of before."

The exchange also focused on reporting procedures and coordination with adjacent units and current EOD best practices.

Growing these capabilities with U.S. and Kazakhstan forces increases regional security and stability in the U.S. Army Central area of operations.

After Kazakhstan military members returned to their country, Army EOD units will follow up with a future in-country demonstration.

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Vietnam memories: Former medical corpsman overcame hurdles

BY ERIC KOWAL

Picatinny Arsenal Public Affairs

Mary Krisanda started her journey as a contract specialist with the Army Contracting Command at Picatinny Arsenal in November 2003.

Krisanda has been married for nearly 46 years and has two adult children and one grandson. She tried to go back into the military when terrorists attacked the United States on September 11, 2001 but was turned away because of her age.

Rewind her life's story to more than 50 years ago, when Krisanda served in the Women's Army Corp during the Vietnam War from 1968-1970.

"It was a privilege to serve my country," she said. "My grandfather and father served in the Army and Navy during World War 11, so I carried on the family tradition and enlisted."

"I was 20 years old and volunteered. They did not draft women. I wanted to carry on the tradition of my family to serve in the military."

One of three adopted children, Krisanda was in her second year of college when she won a scholarship for one year. However, she said not continue because her family had no extra funds to help further her education. She decided to enlist

"We held hands, gave them the best medical care at the time, and gave them support when many of their loved ones gave up and left them."



In this 1968 photo, Pfc. Mary Krisanda had just finished medical training at Fort Sam Houston, Texas, and was on the way to Fort Dix, New Jersey. Courtesy photo.

in the military.

"My sister and brother had muscular dystrophy and unable to serve," she said. "I was partially sighted due to premature birth at just one pound, eight ounces that took part of my sight. I tried every branch of the service and was turned down because of the visual loss, but someone at the Army recruiting station said they could get me in and they did. That made my dad very proud," she said.

Krisanda set off basic training at Fort McClellan, Alabama, on March 7, 1968.

She would then begin her medical training at Fort Sam Houston, Texas, learning to become a medical corpsman.

Later duty stations were at the Walson Army Hospital in Fort Dix, New Jersey and the Valley Forge Hospital in

"The men had terrible injuries, many amputees and head injuries. It was difficult to see men at 18 years of age being injured so badly."

Phoenixville, Pennsylvania.

"My primary responsibilities were to take care of the men on the medical/surgical ward," Krisanda said.

"The men had terrible injuries, many amputees and head injuries. It was difficult to see men at 18 years of age being injured so badly."

Some of the wounded begged the medical staff to let them die, Krisanda recalled.

"But instead we held hands, gave them the best medical care at the time, and gave them support when many of their loved ones gave up and left them," she remembered.

"I was affected by what I saw and handled in the hospital, so much so that I have panic attacks if I enter one to have any procedure. I still see the images in my head."

At Fort Dix, she earned the rank of Specialist (E-5) and married her husband. Upon reenlistment, she was transferred to Valley Forge.

"I had rotational duty and worked all phases of the hospital from the emergency room, to the morgue, maternity ward, pediatrics, psychiatric ward, and the medical/surgical ward where I took care of the men who returned from Vietnam via Japan and or Germany to come home to heal," she said.

Unfortunately, she did not finish her licensed practical nurse training due to complications during a pregnancy.



Mary Krisanda's father and grandfather served during World War II, which inspired her to enlist in the military.

In 1970, Krisanda was honorably discharged.

She then worked as a lock box clerk in Somerset, New Jersey, and later was hired as a reports clerk and promoted to an administrative assistant at AT&T until she retired in March 2003.

During that time Krisanda was able to earn her bachelor's degree, the very same degree she was pursuing almost 40 years earlier.

After the 9/11 attacks, when Krisanda was told she was too old to reenlist, she then turned to the Army Contract Command at Picatinny, deciding that was the place from the home front to help Soldiers. She continues to work at the command to this day.

The Vietnam War Commemoration Seal

"The United States of America Vietnam War Commemoration" is the official title given to the Department of Defense program in the 2008 National Defense Authorization Act.

A representation of the Vietnam Service Medal (ribbon) rests below the inner rings of the Seal.

The red, white, and blue inner rings represent the flag of the United States of America and recognize all Americans, both military and civilian, who served or contributed to the Vietnam War effort.

The outer black ring serves as a reminder of those who were killed in action, held as prisoners of war or listed as missing in action during the Vietnam War.

The black ring surrounds the red, white and blue rings to call attention to their sacrifices, the sacrifices of their families, and the defense of our nation's freedom.

Within the blue ring are the words "Service, Valor, and Sacrifice"; virtues demonstrated by our veterans during the Vietnam War.

The gold-rimmed white star located between the words "Service" and "Valor"

represents hope for the families of those veterans for which there has not been a full accounting.



The blue-rimmed gold star located between the words "Valor" and "Sacrifice" represents the families of those veterans who paid the ultimate sacrifice during the war.

The blue star at the bottom of the inner blue ring represents the families of all veterans and symbolizes their support from home.

At the bottom of the inner blue ring are six white stars, three on each side of the blue

star. These six white stars symbolize the contributions and sacrifices made by the United States and its Allies Australia, New Zealand, The Philippines, Republic of Korea, and Thailand.

The center circle contains a map of Vietnam in black outline relief, signifying both the country and the Vietnamese veterans who stood with our veterans.

The subdued outlines of Cambodia, Laos, Thailand and surrounding waters represent the area of operation where U.S. Armed Forces served.

The white number "50th" emblazoned over the map, and the outer and inner gold rings which make traditional use of the color to signify the 50th anniversary, symbolize the specific mission of the Department of Defense program as outlined in the Congressional language "to commemorate the 50th anniversary of the Vietnam War."

The green laurel wreath signifies honor for all who served.

The seal's blue background is the same color as the canton in the United States flag.



Sgt. Saul Barr, a generator mechanic at the 250th Brigade Support Battalion, New Jersey National Guard, uses the Interactive Electronic Technical Manual with embedded 3-D technologies, at Picatinny during a verification of the manual Jan. 30 for the Common Remotely Operated Weapon Station. Photo by Cassandra Mainiero

3-D manuals improve maintenance

continued from Page 1

and M249—machine guns and grenade launchers. The system also minimizes the warfighter's exposure to hostile events, such as improvised explosive devices.

The manual provides the ability to view a system or component down to a basic level of detail, allowing Soldiers to perform common maintenance tasks on CROWS more easily, including inspection, assembly and disassembly.

The IETM also instructs Soldiers on the correct sequence needed to complete a task, showing step-by-step processes required to become proficient in maintaining the system.

As a result, this interactive manual provides warfighters with continuous learning opportunities and builds a familiarity with CROWS.

The interactive manual for CROWS has several enhancements over previous interactive manuals:

- Clearer, high-quality 3-D animations
- New, "Google-like" search engine

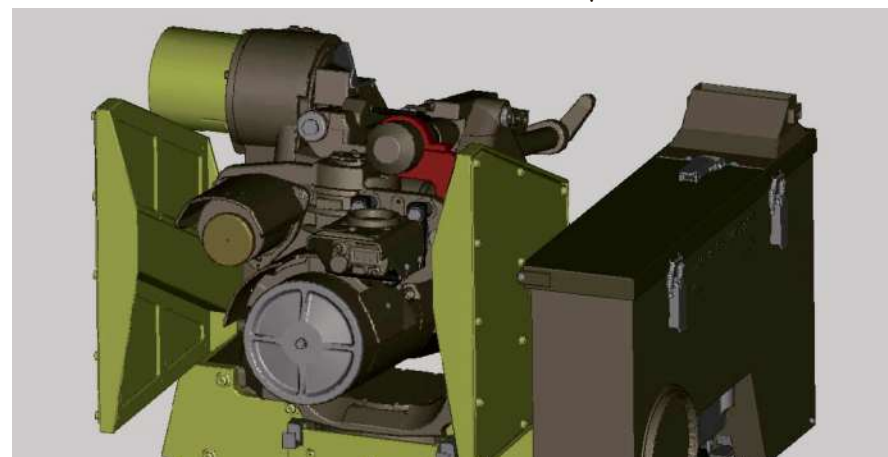
with spell-check

- Increased user-friendliness for navigating the interactive manual
- Improved performance and startup time

"We took the CROWS system and completely disassembled it," explained Thomas Kallopoulos, a maintenance and system support engineer. "We measured all the components and then created a 3-D model to give users a visual aid inside the technical manuals. Now they [the users] can pull apart the system electronically, rotate it, and change all the angles.

"We also created animations with these models that take all the steps and show users how to use it," added Kallopoulos. "So, [the users] can take IETM, click on a task and see it performed on screen before they physically do it on the system. It gives the warfighter an idea of what to expect before completing a task. It helps them visualize it."

Maintaining effective supply operations for parts and manuals has long been vital to Army readiness. However, unless proficient repair skills and replacement parts are available, the most technologically



A 3-D representation of the M153A2 Common Remotely Operated Weapon Station with the ballistic protection assembly highlighted, as displayed in the Interactive Electronic Technical Manual.

advanced system may not perform when needed.

With the IETM, Soldiers can implement and distribute system and procedures updates with ease. A Soldier can also download the IETM through the Logistics Support Agency's website, which further reduces the time for a Soldier to acquire an updated interactive manual.

"The absolute best feature of the system is the 3-D view," said Sgt. 1st Class Robert Nutter, a 91B wheeled vehicle mechanic from the 250th Brigade Support Battalion, New Jersey National Guard.

"In older IETMs, it's not proportioned to when they use the figure numbers. When they give you a diagram, it's a sketch. It's not a photo. It's just a rough, black and white sketch and a lot of the times they're out of proportion. It's hard to tell what piece of equipment they're talking about.

"This [the IETM] is done with a 3-D scanner, it's 100 percent in the dimensions, so right from the bat it's easier to tell what piece of equipment we're talking about.

"The 3-D image view is a godsend because you can pull it apart and find out down to the last screws what item they're talking about and it links it right to the description of that IETM."

While some people are "set in their ways," reluctant to accept the manual, the users love the IETM, says Kallopoulos. The computer access and technology accessible on CROWS and the Spider System also make both systems a suitable platform for IETM.

"The users motivated us," said Kallopoulos. "We train them to read through the instructions before performing them and no one likes to really do that because we're spending 15 or 20 minutes reading about a procedure that you don't understand until you get on the system.

"[With the IETM], they are actually seeing it performed and it helps them out drastically. We strive to give [the users] the best product that we can on the field so that it reduces the time it takes to repair the systems out in the field."

The 3-D interactive manuals, which started in late 2011, are expected to be fielded within the next three months.

Precision-guided howitzer projectiles tested at extreme cold temperatures

By PM CAS

To evaluate performance at extremely cold temperatures, precision-guided projectiles were tested recently in sub-zero temperatures for the Precision Guidance Kit or PGK, which greatly increases the accuracy of 155 millimeter howitzer fires.

PGK is a GPS-guided fuze that affixes to and greatly increases the accuracy of conventional high explosive 155 millimeter artillery projectiles when fired from the M777A2 and M109A6 howitzers.

The most recent evaluation was conducted by the office of the Product Manager for Guided Precision Munitions and Mortar Systems at Picatinny Arsenal, in conjunction with Yuma Test Center at the Cold Regions Test Center in Fort Greely, Alaska.

At the Alaska test center, 21 production-representative PGKs were fired in temperatures bottoming out at -50 Fahrenheit, well below the operational requirement of -25 Fahrenheit.

The purpose of the test was to learn how PGK performs in an extremely cold environment, where ground temperatures

ranged from -5F to -50F. The test team set out to verify both the structural integrity of the PGK as well as the aerodynamic stability of the PGK fuze projectiles in low density, extremely cold atmosphere.

"PGK was very successful during the test and 18 of 21 PGKs fired successfully guided to the target achieving an average radial miss distance of approximately 37 meters," said Maj. Pat Farrell, Assistant Product Manager for PGK.

In comparison, non-PGK, conventionally fuze artillery is expected to impact well over 200 meters from the target due to the natural dispersion caused by environmental effects on the projectiles at maximum ranges.

The test also marks the first time the M777A2 operated at -50F at the outdoor range complex at the cold regions testing facility.

This operational test will inform a full rate production decision for PGK slated for October 2015.

The Army Acquisition Objective for PGK is more than 102,000 fuzes.



An instrumented M777A2 is ready to fire a Precision Guidance Kit from behind a blast shield at the Cold Regions Test Center in Fort Greely, Alaska.

Army engineers help to define future aviation fleet

BY DAN LAFONTAINE

RDECOM Public Affairs

ABERDEEN PROVING GROUND, Md. -- The U.S. Army science and technology community is charting the future of military vertical lift aviation that will enable warfighters to accomplish missions not possible today.

The Army, supported by NASA and the Navy, is combining its areas of technical expertise to accomplish the aggressive scientific and engineering goals necessary to develop a new fleet of joint aircraft, said Ned Chase, deputy program director of science and technology, or S&T, for the Joint Multi-Role Technology Demonstrator/Future Vertical Lift, also known as JMR TD.

JMR TD has been established to address several of the capability gaps that cannot be satisfied by updating the current fleet.

"Let's figure out what we want this new aircraft to do, and let's go out and prove that we have the technologies available to meet those requirements. That's what we're doing with JMR TD," said Chase, with the Army Aviation and Missile Research, Development and Engineering Center, or ARMDEC, on Fort Eustis, Virginia.

The Department of Defense is using JMR TD to design and integrate the technologies that will eventually feed into the Future Vertical Lift, or FVL, and replace the military's vertical lift fleet with a new family of aircraft.

RDECOM PARTICIPATION

"The Aviation and Missile Research, Development and Engineering Center, or AMRDEC, one of seven centers and laboratories that make up the U.S. Army Research, Development and Engineering Command, also known as RDECOM, is leading the S&T effort.

Chase and his team are working closely with fellow scientists and engineers within RDECOM to conceptualize research and design the many technologies that will be necessary for this future vertical lift capability.

AMRDEC will leverage its expertise in aviation; however, the team will rely upon its peer organizations for the complementary pieces.

For example, RDECOM's Communications-Electronics Research, Development and Engineering Center at Aberdeen Proving Grounds, or APG, is the expert in areas such as communications systems, sensors and cameras, he said.

"The one thing that we've not done in quite a long time was demonstrate that we can build an aircraft from scratch that incorporates the individual technologies that we've been working on the past 25 years," Chase said. "We have the capacity across AMRDEC to populate the aircraft with the right components--engines, rotors, structures, flight controls.

"We want to put together a roadmap to



The tiltrotor V-280 Valor aircraft is Bell Helicopter's vision of the future as it prepares for flight demonstrations for the U.S. Army in 2017. Artist rendering courtesy Bell Helicopter.

develop the radios, weapons, sensors and survivability equipment by drawing from RDECOM in preparation for FVL. We take their products and integrate them onto the platform itself. FVL is going to reflect the aggregate of RDECOM investment."

Charles Catterall, AMRDEC lead systems engineer, has worked to develop an S&T integrated product team to build an investment strategy across RDECOM.

"We are engaging our sister organizations within RDECOM. What can the command do to support this program? What resources can be brought to bear to facilitate and support this Future Vertical Lift initiative with technologies? Given a clean sheet, could you bring additional capabilities to bear? We're looking across the command," Catterall said.

Catterall said JMR TD has two components--the air vehicle demonstration, or AVD, and mission systems architecture demonstration, or MSAD. Two contract teams--Sikorsky-Boeing and Bell Helicopter--are responsible for the design, analysis, fabrication, ground testing and ultimately, flight testing of the demonstrator aircraft.

The industry proposals for FVL include the capability to carry a payload of 12 troops and four crew, hover out of ground effect at an ambient condition of 6,000 feet and 95 degrees Fahrenheit, and self-deploy 2,100 nautical miles at a speed of at least 230 knots.

The MSAD portion will integrate technology concepts from across RDECOM, as well as the Department of Defense, into an open, efficient, effective and enduring architecture.

The MSAD initiative will develop a standard reference architecture that can be used as the basis for design and implementation of an avionics architecture. This will enable hardware and software reuse across multiple mission design series aircraft and multiple vendor implementations, Chase said.

The knowledge, standards, processes and tools necessary to design and implement such a mission systems architecture that is affordable will be used to inform the government's generation of requirements

for the anticipated FVL program.

Chase said that a major challenge for DoD scientists and engineers is to develop their specific pieces of technologies - whether sensors, weapons, cameras or crew systems--and ensure they function correctly within a much more demanding future aviation environment than exists today.

"This future fleet will be faster and go farther. We're trying to ensure that the other [research centers] understand how the aviation environment and constraints change when we go from flying aircraft at 130 knots to 250 knots," Chase said. "The environment we're creating for weapons, sensors and radios is much different with FVL than the current fleet. FVL will operate in a different performance regime."

ARMY LEADS JOINT AVIATION PROGRAM

Developing a joint aircraft instead of a separate version for each service is expected to save time and money in technology development, training, maintenance and logistics, Chase said.

There are four classes of aircraft that have been identified for the fleet - light, medium, heavy and ultra.

"We want to develop technology applicable to each of the four basic aircraft of the FVL family, and then populate them with the mission equipment that is required to satisfy each of the service's missions," Chase said. "You're working from the same framework of requirements and technologies.

"You don't have to do individual technology developments for every single class of aircraft in the fleet. It's about efficiency of investments, costs and logistics."

Working with NASA and Navy scientists and engineers brings complementary expertise to the project, he said. Significantly different missions among the services require different skill sets among the aviation subject-matter experts.

"Because it is a joint requirement, it drives you to having a joint team. We have a mixed team to address a comprehensive requirement that neither the Army nor Navy S&T enterprise might be capable of solving entirely by itself," Chase said.

"The Army operates across land, and we have specific missions - air assaults, attack and reconnaissance. The Navy has a different challenge with operating on the ship, which drives the space that an aircraft can fit on and be maintained in. For the Marine Corps extended range is extremely important."

First flight testing is expected in summer 2017. The technologies to be integrated onto the platform should be at technology readiness level 6, or a prototype level, between 2022 and 2024.

While an agency such as the Defense Advanced Research Projects builds single-purpose aircraft, the goal of JMR TD is to develop a fleet that will achieve several stringent goals.

"We're in pursuit of several aggressive individual requirements that in the aggregate is something way beyond what we can do today," Chase said. "We have to be able to operate all over the world, in any kind of environment, across a speed spectrum that allows us to do our mission anywhere, anytime."



Capt. Thomas Murphy (far right), a Canadian Exchange Officer, demonstrates how the Lulzbot TAZ 4, a 3-D printer, functions in Picatinny's Innovation Materials Hub as part of the arsenal's "Lunch and Learn" series on Feb. 18. Murphy works in the Advanced Material Technology Branch under the Armament Research, Development and Engineering Center, or ARDEC. "Lunch and Learn" events focus on introducing the ARDEC workforce to Picatinny's innovative facilities and capabilities as well as showcase the arsenal's 3-D printing and scanning abilities.

Picatinny Arsenal observes Black History Month

Brig. Gen. Jason T. Evans, deputy commanding general for support at the U.S. Army Installation Management Command, was the guest speaker during Picatinny Arsenal's Black History Month observance Feb. 23 at the arsenal's Cannon Gate Catering and Conference Center. Photo by Todd Mozes.



BY CASSANDRA MAINIERO
Picatinny Arsenal Public Affairs

"There is no greater country than the United States of America, a country made great by its relatively young but rich history. But when we talk about the richness of our history, it's difficult to do so—at least for me—without also acknowledging the diversity of its people and their contributions to our nation," said Brig. Gen. Jason T. Evans, the guest speaker Feb. 23 at Picatinny Arsenal's observance of Black History Month.

"The achievements of African-Americans helped to shape our unique culture, maintain the world's most powerful military and transformed our politics and government," added Evans. "While there is still more work to be done, Black History Month is a model, it's a reminder why it's important to celebrate history."

Evans is the deputy commanding general for support at the U.S. Army Installation Management Command in Fort Sam Houston, Texas. In addition to his speech, the arsenal's observance included historical and pop culture trivia as well as a reading of Maya Angelou's poem "Still I Rise."

Black History Month began in 1926 and was founded by Carter G. Woodson. Originally the event lasted a week. But in 1976, the 100th anniversary of the United States, the week was extended to one month, allowing for more inclusion of activities and programs.

Woodson chose the second week in February because both President Abraham Lincoln and Frederick Douglass, an abolitionist, were born

in the month of February. Moreover, Woodson thought that these two men significantly improved the lives and social conditions of African Americans.

Each February, the United States Army honors the remarkable contributions of African American men and women in the building of the nation. The 2015 theme, selected by the Association for the Study of African American Life and History, is "A Century of Black Life, History, and Culture." This theme highlights the fact that over the past century, African American life, history, and culture have become major forces in the United States and the world.

The Army leadership has asked the entire Army family to publicly commemorate the significant contributions that continue to make the Army the premiere fighting force in the world. Throughout the year, the Army will celebrate and commemorate the diversity of the Army and leverage and draw strength from the rich diversity within the ranks by recognizing the critical role played by all in strengthening the nation's presence around the world.

America's Army is a world-class force, recruiting the best talent regardless of race or gender. The Army ensures the integration of diverse attributes, experiences and backgrounds in ways that enhance decision making and inspire high performance.

The Army has benefited from the contributions of African American generals like Gen. Lloyd J. Austin III, Gen. Dennis Via and Major Gen. Marcia M. Anderson, to name a few.



John Hedderich, director of the Armament Research, Development and Engineering Center speaks to participants in a Master Resiliency Training (MRT) Executive Course held here Feb. 18-19 and hosted by ARDEC. The training provides the skills necessary to face and successfully overcome adversity and stressful situations while supporting a culture of optimism and adaptability and promotes greater synergy across the enterprise. The intent of hosting the Executive Course was to educate ARDEC senior leadership about the program benefits and gain support as Certified ARDEC MRTs begin in-house training May 11-22 for the greater workforce. At left, standing, is ARDEC Military Deputy Col. Scott Turner.



AIM HIGH, AIM HIGHER

BY LAUREN POINDEXTER
Picatinny Arsenal Public Affairs

Dana Born, lecturer in public policy, Harvard University, speaks to employees about the importance of leadership and character development in the workplace Feb. 24 during the Armament Research, Development and Engineering Center's (ARDEC) leadership speaker series. The series is a part of ARDEC's leadership development program.

Born is a retired brigadier general with 30 years of service in the U.S. Air Force. From 2004 to 2013, she served two terms as dean of the faculty for the U.S. Air Force Academy, where she was also a professor and head of the Behavioral Sciences and Leadership Department.

Born also served as assistant director for Recruiting Research and Analysis in the Office of Assistant Secretary of Defense for Force Management Policy, aide to the Secretary of the Air Force, and Deputy Chief of the Personnel Issues Team in the Office of the Deputy Chief of Staff for Personnel.

She commanded the 11th Mission Support Squadron at Bolling Air Force Base in Washington, D.C., was an exchange officer with the Royal Australian Air Force, and served in Afghanistan in support of Operation Enduring Freedom.

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Picatinny event, 'Introduce a Girl to Engineering,' doubles in size

BY CASSANDRA MAINIERO

Picatinny Arsenal Public Affairs

"I've seen a lot more women than I thought I would see," said Jessica Perkins, 15, from Bridgewater High School, during Picatinny Arsenal's third annual "Introduce a Girl to Engineering" event Feb. 26 for approximately 75 local high school females.

The event, which nearly doubled attendance this year due to demand, aims to encourage females to pursue careers in science, technology, engineering, and mathematics (STEM). These career fields are predominantly male.

"The nation, and the Army, need more women to enter the STEM fields so that America can continue to be a leader in technical innovation," said Ed Petersen, Picatinny STEM Program Manager. "This is an opportunity for local female high school students to speak with several of our women engineers working in the military's cutting-edge STEM fields, and to hopefully help close the gender gap in these fields."

During the event, Picatinny engineers showcased the products that they work on, including waterproof coatings, nanotechnology, 3-D printing, Navy ammunition and Weaponry, remote weapon systems and aeronautics. By participating in hands-on demonstrations and experiments, attendees were given a first-hand appreciation for the engineering at Picatinny.

"I think it's exciting anytime we can get anybody engaged in engineering," said Jennifer Batz, chief of the arsenal's Weapons Fire Control and Software Quality and Reliability Safety Engineering Division.

"But, I think that most females believe that they can't do it because they are told sometimes that they're not supposed to be good at math, they're not supposed to be good at science. They're not formed and developed that way," Batz continued. "So, I think it's exciting that we can demonstrate that there are people who have done this and you can do it just as easily."

School districts represented at the event included Bloomfield, Boonton, Bridgewater-Raritan Regional High School, Dover, East Orange STEM Academy, High Point Regional, Jefferson, Montclair, Montgomery, Morris Catholic, Morris Hills Academy, Morris Knolls, Mount Saint Mary Academy, Mount Olive, Newton, Paramus, Parsippany, Phillipsburg, Pope John XXIII Regional High School, Randolph, and Sparta, Sussex Technology and Verona.

"I'm not quite sure what I want to do in college yet, but I know I like math and science and want to be a nurse, so I'm looking for a job that combines all that," said Marisa Lakin, 17, from Verona High School, who heard about the event through her math teacher. "[This event] is really interesting because there's a broad spectrum of things that you can see and do and I like that there all different types of military here, too."

"I liked the table with 3-D printing and the station where you got to see how Soldiers wear these suits to simulate what they would do in the field and then they make—not a videogame—but like a simulation," said Giuliana Frizzi, 15, from Verona High School, whose favorite subjects are math and science.

"I think organizations like Picatinny ... raise that awareness that even though you're a girl you can do it, and that's just really nice to know," added Frizzi.

"Introduce A Girl To Engineering" was co-hosted by ARDEC, the U.S. Navy representatives at Picatinny's, the arsenal's STEM office, the Women in Defense-Picatinny Chapter as well as ARDEC's Diversity Advisory Council.



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